

Testimony
Subcommittee on Fisheries and Oceans
The Honorable Wayne T. Gilchrest, Chairman
U.S. House of Representatives, Committee on Resources
21 March 2006 Gretna, Louisiana

Nancy N. Rabalais, Ph.D.
Executive Director and Professor
Louisiana Universities Marine Consortium
8124 Hwy. 56
Chauvin, LA 70344
985-851-2801, -2874 fax, 985-870-4203 cell
nrabalais@lumcon.edu

Representatives and Guests,

Thank you for the opportunity to speak before this committee on important issues of 2005 hurricane damage to Gulf of Mexico fishery resources and steps to aid in recovery.

I am the Executive Director of Louisiana Universities Marine Consortium (LUMCON) in Cocodrie, Louisiana, approximately 90 miles southwest of New Orleans. Our Marine Center is strategically situated at the upper end of Terrebonne Bay at the interface of productive salt marshes, bays and the Gulf of Mexico, and between the active deltas of the Mississippi and Atchafalaya rivers. Our surrounding communities depend on the commercial harvest of shrimp, crabs, oysters; marsh, bay and offshore recreational fishing; hunting, trapping; tourism; the oil and gas industry; and a long history of living with the land. Our surrounding communities have been hit, like much of coastal Louisiana and Mississippi, by the back-to-back devastating Hurricanes—Katrina and Rita.

I served on the Working Group that produced the document “*A New Framework for Planning the Future of Coastal Louisiana after the Hurricanes of 2005.*” I was Chair of the Ocean Studies Board of The National Academies when it was commissioned by the U.S. Army Corps of Engineers and the Louisiana Department of Natural Resources to review the Louisiana Coastal Area (LCA) Restoration Plan and the Near-Term LCA projects. The results of these deliberations is “*Drawing Louisiana’s New Map: Addressing Land Loss in Coastal Louisiana.*” These two documents include, among others, two simple, but important, statements:

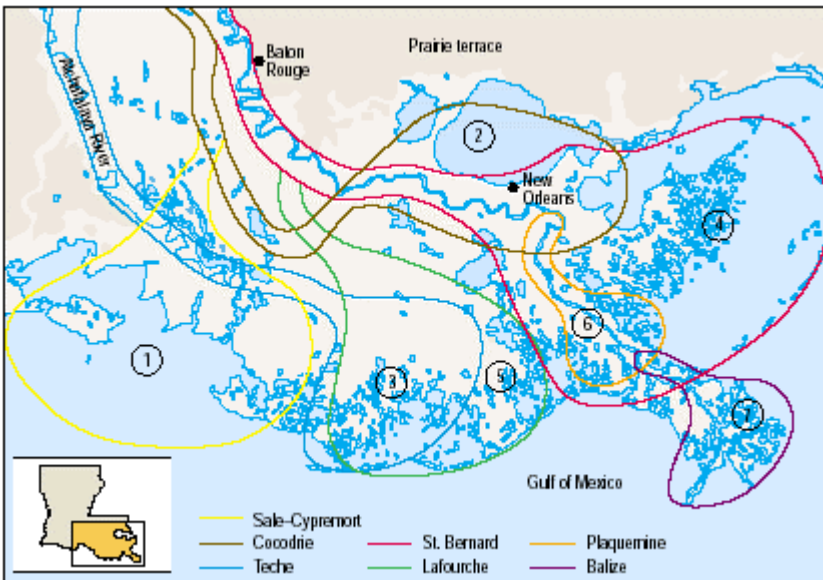
- **The need for restoration projects to be placed within the context of a larger, well-conceived coastal landscape.**
- **Some ‘Near-Term’ plans may not be appropriate for this longer-term goal.**

Following the 2005 hurricanes, the “*Framework*” document makes a clear statement that most Louisiana citizens support:

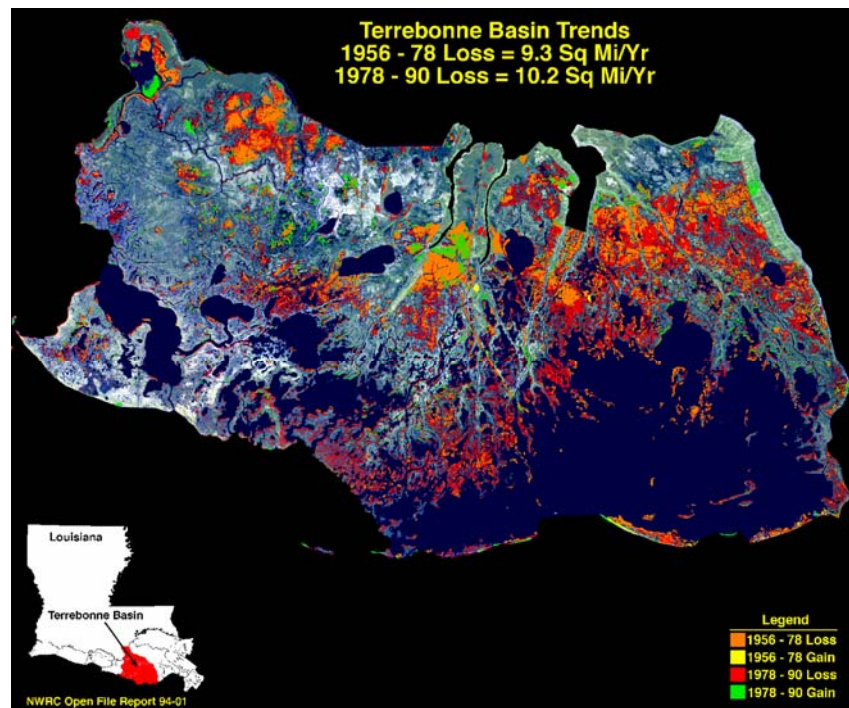
..... in the long term, hurricane protection in Louisiana can only be secured with a combination of levees and a sustainable coastal landscape.....

The land surrounding our LUMCON Marine Center, near the (1) in the map, and our communities was built early in the geologic history of the Mississippi River delta formation on the Teche and LaFourche delta lobes. The natural subsidence cycles of delta building occurred

but kept pace with apparent sea level rise until the last half of the 20th century, when human impacts on the system and land loss began.

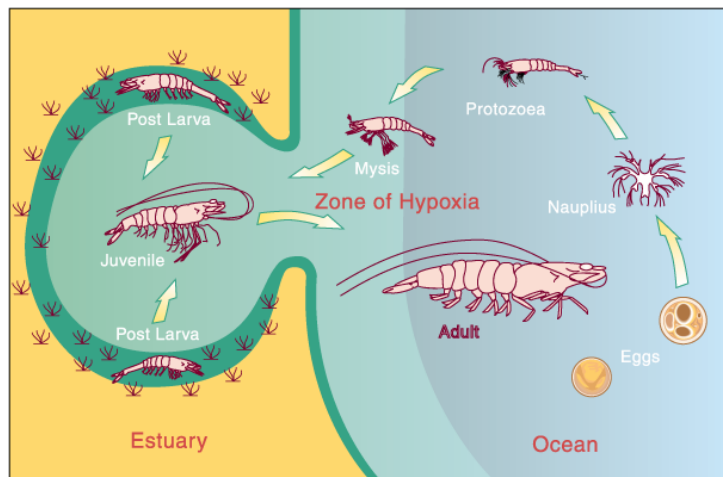


The long-term loss of barrier islands, marshes, wetlands and erodable lands is substantial in the parishes of LaFourche and Terrebonne.



The need for barrier beaches, wetlands and marsh habitat for fish and shellfish resources, habitat, storm protection, and support for communities and infrastructure is well known. Most of the commercial and recreational fishery resources of Louisiana depend on the estuaries, marshes,

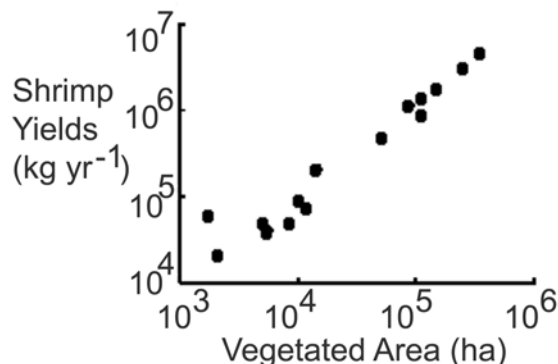
and subtidal habitats for spawning, recruitment, nursery areas, and essential habitat through parts of their life cycles.



The brown and white shrimp that form the basis of the #1 fishery in terms of dollars depend on the estuaries for their successful growth and the livelihood of their harvesters.

There is a well-documented relationship between the area of vegetation within an estuary and the shrimp yields from that estuary. This is a Gulf of Mexico wide relationship. Louisiana, of course, leads the Gulf in shrimp harvest. With the loss of wetlands, fishery yields can be expected to decline.

Gulf of Mexico shrimp landings (annual) and the area of wetland in each estuary (Turner, 1977).



It is also well-documented that juvenile shrimp in the estuaries prefer to use the marsh edge rather than the marsh interior or the open bay bottom for habitat. As wetlands break apart, the amount of marsh 'edge' increases, and so potentially does the shrimp yield. However, at the point that the wetlands deteriorate to the point where all marsh disappears, suitable habitat is minimal, and the shrimp yield can be predicted to go down.

The loss of wetlands prior to and because of the 2005 hurricanes is a critical point to be considered in the recovery of fish and shellfish, fishery habitats, and the communities that depend on these resources. Communities that derive their livelihood and culture from fishing join the many other coastal and inland communities that consider the coastal landscape to be a primary barrier against the ravages of hurricanes and tropical storms.

"Framework"

..... in the long term, hurricane protection in Louisiana can only be secured with a combination of levees and a sustainable coastal landscape.....

Over the last week (March 9-16), the US Army Corps of Engineers (USACE) hosted a series of public meetings to solicit comments on category 5 hurricane protection for south Louisiana. The Corps was directed by Congress to work closely with the State of Louisiana in developing the Category 5 South Louisiana Coastal Protection and Restoration Report. Meetings were held in New Orleans, Thibodaux, Lake Charles and Lafayette. The message from citizens for needing **levees** to protect communities was clear. In addition and sometimes more importantly, the citizens called for a healthy and **sustainable coastal marsh, wetland, and barrier island buffer** as a critical component of hurricane protection. The coordinated, well-designed and considered approaches to levees and coastal restoration can only be beneficial to the communities that depend on coastal habitat and fishery resources for their livelihood and way of life.

“Framework”

Despite land subsidence and sea-level rise, a wetland-dominated landscape can be sustained through this century.....

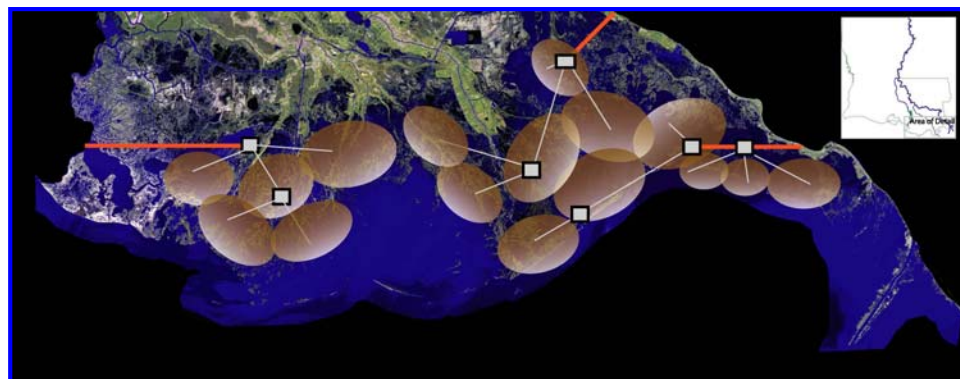
....but it will take aggressive action and bold, not timid steps.

Coastal wetlands and barrier shores need to be rebuilt and quickly. River diversions and siphons are insufficient for land building and were never designed to build land. Rather they were



designed to alter salinity regimes in support of fish and shellfish resources. Significant amounts of sediments are needed and are not readily available in a suspended mode in river water to make a difference in sediment delivery. Alternatives that have been long proposed, but are gaining more consideration at present, are sediment slurries carried by pipeline to areas in need of sediments and the beneficial use of dredged material. The USACoE New Orleans District alone dredges 70 million cubic yards annually. The amount dredged

from the Mississippi and Atchafalaya river navigation channels exceeds the amount needed for restoration according to the USACoE.



A critical point in the use of these sediments is the need to place them strategically and in such a way as to support the natural evolution of hydrology, sediment delivery and marsh formation once the sediments are in place. These created wetlands will eventually support critical fishery

habitat and important fisheries, as well as buffer the fishing communities and other residents of coastal Louisiana.

“Framework”

Levees will continue to be the major component of protecting citizens, controlling flood waters, and maintaining navigation, but.....

..... a continuous storm barrier along the coast is not compatible with a sustainable landscape in Louisiana because it would interfere with the natural processes that allow wetlands to survive over centuries.

Louisiana citizens have expressed their concerns about a line of levees reaching across the southern part of the state. Regardless of engineered floodgates and points of egress and ingress for water, sediment, and organisms, such a plan will necessarily disrupt the remaining natural hydrology of coastal wetlands and lead to their further demise. Citizens who live in leveed areas have seen the marshes disappear on both sides of the levee.

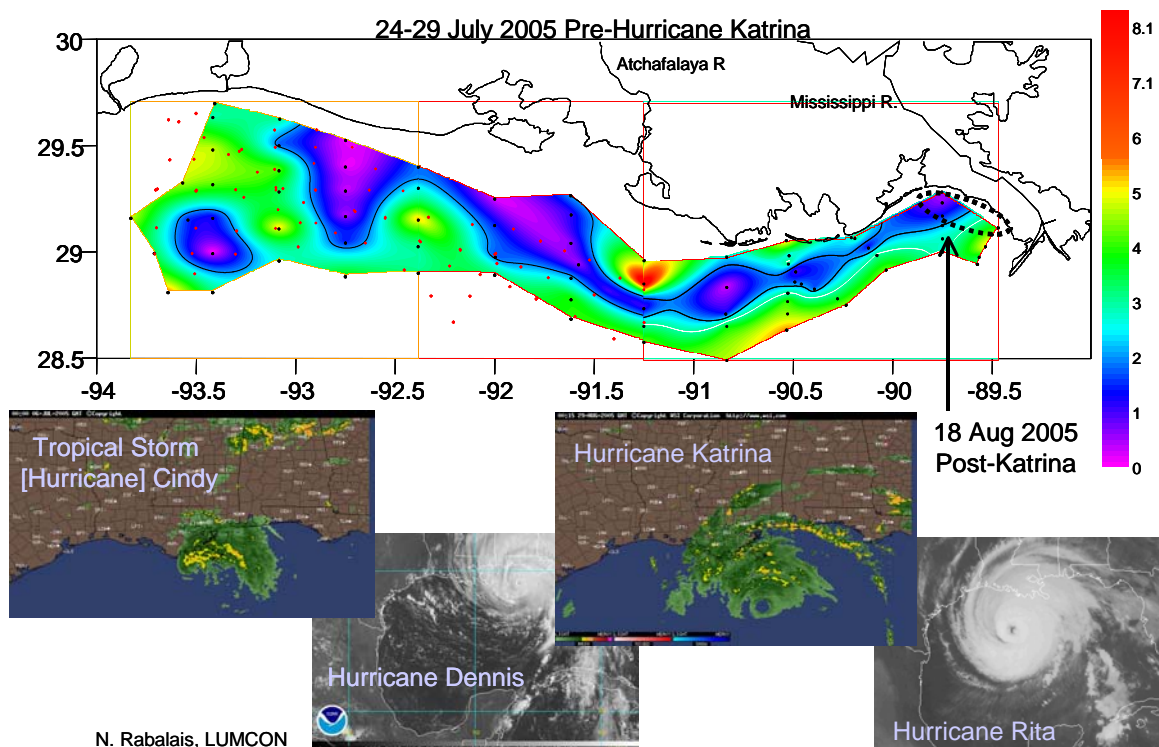
“Dead Zone”

One of my areas of research is the area of low oxygen in the Gulf of Mexico, commonly called the “Dead Zone.” Questions arise both concerning its impacts on fishery resources and the effects that hurricanes have on disrupting the areas of low oxygen. The area of low oxygen waters varies from year to year in maximal extent, timing, and spatial variability according to the delivery of nutrients from the Mississippi River and weather and oceanographic patterns. The five-year average size of bottom-water hypoxia in the Gulf of Mexico for 2001-2005 is 6,000 square miles with a maximal extent in 2002 8,500 square miles. Few marine animals can survive in oxygen concentrations this low. They must escape or succumb to the low oxygen. There is an obvious exclusion of shrimp, croaker, drum, and snapper from the hypoxic waters of the ‘Dead Zone’ and significant decrease in their food resources that reside there and cannot escape.

Tropical Storms and Hurricanes, while devastating to coastal communities, do temporarily alleviate the low oxygen conditions as they mix the water column. Given sufficient calm weather following a storm, the low oxygen conditions will redevelop within a week. This was the series of events following Hurricane Katrina. Two weeks after passage of the storm we surveyed the area for low oxygen and found a small area in the Mississippi River Bight. The storm most certainly mixed the water column, but the resuspended sediments and carbon, and the export of marsh debris and associated sediments provided the fuel for low oxygen to recur and at a very severe level. By the time that Hurricane Rita advanced across the southwestern part of the Louisiana coast, fall cold fronts had prevented the reformation of low oxygen and there was no ‘Dead Zone’ to be disrupted.

Needless to say, hurricanes are not my recommended mechanisms to solve the low oxygen problem in the Gulf.

Hypoxia was well formed in June 2005, somewhat intact after T.S. [now Hurricane] Cindy, and expanded in August until Hurricanes Katrina and Rita.



Importance of Research in the Understanding and Recovery of Fisheries

There is a need for research to develop the best plans for marsh restoration that combine the needed levees and coastal buffers for hurricane protection. These plans need to take into account the functionality of restored coastal landscape from the viewpoint of essential habitat for fishery resources. Restoration may create land, but not necessarily functional marshes that provide adequate nursery areas and essential fish and shellfish habitat. Avoiding this pitfall is even more important as we merge coastal restoration and marsh development into hurricane recovery plans.

Several avenues are available for funding appropriate research projects—the LCA Near-Term Restoration Plan Science and Technology program, the NOAA CREST program (Coastal Restoration and Enhancement through Science and Technology), and competitive research awards from funding agencies such as NSF, the NOAA Center for Sponsored Coastal Ocean Research, EPA, and others. There should be an effort to avoid duplication of effort and unnecessary expenditures on projects that might not be relevant (as was the case in the flurry of post-Katrina funding). Where this coordination might exist is not clear.

Fisheries research along the Gulf coast has always been within a context of a changing coastal landscape and susceptibility to hurricanes. Within the current period of frequent and severe storms and the potential for their increase with climate change, it is important to have the researchers and modelers that can help the coastal landscape architects think through these issues.